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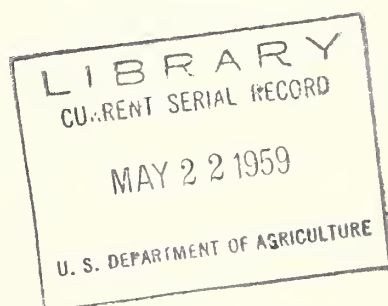
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REPORT

of the

FOURTEENTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City,
March 6 and 7, 1959



Reported by
G. F. Sprague, Secretary

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Crops Research Division
Plant Industry Station, Beltsville, Maryland
CR-24-59-April 1959
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TABLE OF CONTENTS

	<u>Page</u>
Afternoon Session, March 6 -----	2
I. Definition of open formula pedigrees and review of inbred exchange vs. inbred release within the scope of the three- year delayed release policy -----	2
II. Summary of the cooperative stalk project -----	3
Evening Session, March 6 -----	8
Morning Session, March 7 -----	9
Report of the Sub-committee on the uniform tests of the 100 and 200 maturity series -----	9
Report of the Sub-committee on the uniform tests of the 300 to 500 maturity series -----	14
Report of the Sub-committee on the uniform tests of the 600 to 700 maturity series -----	14
Report of the Sub-committee on the uniform tests of the 800 to 900 maturity series -----	17
Report of the committee on pollinating supplies-1958 -----	17
Report of the committee on nomenclature of cytoplasmic sterility -----	18
Report of the committee on registration of NE hybrids -----	18
Report of the committee on disease and insect pests of corn ---	18
Report of the committee on preservation of open-pollinated varieties -----	19
Report of the nominating committee -----	19
Performance of dwarf hybrids in the Northeast -----	19
Present status of recurrent selection in corn breeding -----	26
New Business -----	27
Roster of Attendance -----	28
Officers and Committee membership, 1959 -----	29



REPORT OF THE FOURTEENTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City, New York
March 6 and 7, 1959

Reported by G. F. Sprague, Secretary

The meetings of the Fourteenth Northeastern Corn Improvement Conference were held in the Henry Hudson Hotel, New York City on March 6 and 7, 1959.

A total of 30 workers representing 8 states, the U. S. Department of Agriculture, 2 Canadian Provinces and 2 producers of open pedigree hybrids were in attendance.

AFTERNOON SESSION, MARCH 6

The meeting was called to order by Chairman H. L. Everett at 1:00 p. m. After introductions the first order of business was the appointment by the Chairman, of a Nominating Committee consisting of R. G. Rothgeb, Chairman; J. C. Anderson, and R. M. Bailey. The conference then proceeded to a consideration of the discussion topics listed on the program agenda.

DEFINITION OF OPEN-FORMULA PEDIGREES AND REVIEW OF INBRED EXCHANGE
vs INBRED RELEASE WITHIN THE SCOPE OF THE THREE YEAR DELAYED
RELEASED POLICY

Dan Butler

Dan Butler served as discussion leader and posed the following questions:

1. Must pedigrees appear on seed tags and/or sales literature?

After considerable discussion it was agreed that the pedigree was of little value to farmers and need not necessarily appear on the seed tags. However, the pedigree must be made available upon request if the hybrid is to be considered open formula.

2. Must the Pennsylvania Farm Bureau make pedigrees available upon request?

In line with the decision indicated above the answer was "yes" providing the hybrids are considered to be open formula.

3. May the pedigree of a hybrid be changed without a change in designation?

The consensus was that this practice would be in violation of the Federal Seed Act and the answer must therefore be "no".

4. What is the current conference policy on release of lines?

Among the states having lines in commercial use the following policies were indicated.

Connecticut - any line considered to have merit is released with no delay provisions.

New Jersey - lines exchanged with other agencies but no lines are released.

New York - Three year delayed release.

Pennsylvania - Three year delayed release.

West Virginia - lines released, no formal policy.

In the course of the discussion the undesirability of this variation in policies and procedures was discussed. It was brought out that lines produced by Eastern States or Pennsylvania Farm Bureau were released to cooperating agencies upon request. Eastern States however, considered that lines derived from planned programs, such as the current work on dwarf lines and hybrids, constituted a special category and would not be released. Stocks of such lines at an early stage of development, however, would be provided upon request.

After considerable discussion of this problem it was moved by Pearson and seconded by Jones that the group go on record requiring that all members of the Northeastern Corn Improvement Conference follow a uniform policy on release and that any Station not complying be excluded from the Conference. This motion was passed unanimously.

5. Should a new strain of an old line, i.e. differing by a single gene, be subject to delayed release.

The discussion on this topic paralleled to some extent the discussion under question 4. It was suggested that each such instance must be considered as a special case and no general agreement was reached.

SUMMARY OF THE COOPERATIVE STALK ROT PROJECT

A cooperative stalk rot experiment was begun in 1958 by members of the N.E.C.I.C. from northeastern United States and Canada. Seed of 10 inbred corn lines of promising resistance to stalk breakage was distributed to several members by H. L. Everett of New York. Agreement was made to make two field plantings two weeks apart at each station, to inoculate 1/2 of the plants artificially with Gibberella zeae supplied by C. W. Boothroyd at New York, and to take weekly breakage data on the other 1/2 under natural field conditions. Seed for possible continuation of the project in 1959 was to be made by New Jersey and Pennsylvania.

The following summaries were made from reports sent by the cooperators. Limited seed supplies and inclement weather were primarily responsible for lack of uniformity in results of this season's testing. It is believed that the data collected were very informative and that the experiment should be continued in 1959.

Connecticut (J. G. Buchert, D. F. Jones, H. T. Stinson, Jr.)

Germination was poor, stands thin. Plants were not in half silk until late August, early September. Push-test readings terminated October 31 revealed up to 94% breakage, approximate order of susceptibility of inbreds from most resistant (20%) to most susceptible (94%) being C103, 38-11, Oh26, Oh51A, Oh43, Oh07, A401, L317, Os420, Pa54. Refractometer readings were taken of stalk juices expressed from the second internode above the ear of all inbreds (Table 1). Because of the late maturity of the inbred material, and the fact that "high and low sugar lines do not distinguish themselves until about the time of grain maturity", how much significance can be attached to the data is questionable.

Table 1. Refractometer readings of corn stalk juice from second internode above ear (average of 10 plants). Reading (1) on 9/25, reading (2) on 10/15, Mt. Carmel, Conn., 1958.

Inbred	Days after 1/2 silk	Reading (1)	Days after 1/2 silk	Reading (2)
Oh07 (1st pl.)	32	10.0	52	10.1
" (2nd pl.)	?	6.8	?	7.9
C103 (1)	37	9.7	57	9.5
" (2)	18	8.9	38	11.1
Oh43 (1)	43	9.9	63	5.1
" (2)	17	9.2	37	8.4
L317 (1)	23	10.7	43	10.7
" (2)	2	8.2	22	10.6
38-11 (1)	32	6.1	52	6.1
" (2)	16	6.5	36	7.9
Os420 (1)	41	9.9	61	7.6
" (2)	25	11.6	45	8.0
Oh51A (1)	45	8.2	65	9.4
" (2)	35	10.1	55	9.6
Oh26 (1)	42	9.4	62	10.3
" (2)	26	11.1	46	12.9
Pa54 (1)	43	6.7	63	7.9
" (2)	29	10.5	49	6.6
A401 (1)	40	8.7	60	9.5
" (2)	28	9.9	48	9.0

Eastern States Farmers' Exchange, Inc. (D. L. Matthews)

The first seeding was flooded. The second seeding was delayed by poor weather and the ears were not formed. No stalk breakage data were taken.

Maine (R. M. Bailey)

All corn inbreds matured late, if at all, because of the cool wet season. No stalk rot was observed in the N.E.C.I.C. planting.

Montreal, Canada (R. Braun)

The Montreal planting was late and maturity so delayed that no data could be collected.

New Jersey (J. C. Anderson, R. A. Cappellini)

The 10 inbreds were planted on May 14 and June 3 and stalk rot data taken under natural field conditions until November 25 (Table 2).

Table 2. Stalk rot occurring naturally in corn inbreds, New Brunswick, N. J., 1958.

Inbred	Planting date	Days to $\frac{1}{2}$ silk	% stalk rot on					
			9-16	9-29	10-12	10-27	11-10	11-25
Os420	5-14	79	16	54	72	98	100	100
Oh43	"	83	--	--	--	--	--	--
Pa54	"	78	42	96	99	99	99	99
Oh51A	"	73	20	67	77	92	97	100
A401	"	79	6	62	72	96	98	98
Oh26	"	79	0	33	54	54	58	100
Oh07	"	90	0	0	8	44	79	88
C103	"	81	0	0	10	20	40	50
L317	"	90	0	0	0	58	96	99
38-11	"	88	0	0	4	70	92	100
Os420	6-3	69	0	0	16	75	96	99
Oh43	"	70	0	0	0	60	80	80
Pa54	"	66	13	84	86	100	100	100
Oh51A	"	67	0	13	78	96	96	100
A401	"	70	0	0	17	81	90	90
Oh26	"	70	0	2	16	68	91	91
Oh07	"	75	0	0	0	18	51	51
C103	"	73	0	0	0	28	39	49
L317	"	82	0	0	0	24	72	83
38-11	"	79	0	0	0	37	72	82

Ten plants of each of 6 inbreds were inoculated with G. zeae sent to R. A. Capellini. The results of artificial inoculation revealed the following rot percentages when data from the two planting dates were combined: Pa54 (48%), Oh51A (54%), Oh26 (74%), Os420 (75%), A401 (94%), and Oh43 (93%).

New York (C. W. Boothroyd, H. L. Everett)

All 10 inbreds were planted for observation under natural conditions. There was not enough seed for an artificial inoculation test. Seedlings were late and plants were green and immature into November. Although weak stalks were few, C103, Oh07, 38-11, and Oh26 were visibly better in standability. L317 froze at the nodes and went down badly.

Isolations were made from stalks and roots of the inbreds grown by the cooperating members. G. zeae was recovered from the majority of the specimens submitted. A comparison of morphology and pathogenicity of these isolates is to be made.

Three stalks were selected at random from all inbreds of the first planting at Ithaca, N. Y., and transverse sections were cut from internodal areas of these stalks. In Table 3 are given data based on observation of these sections.

Table 3. Summary data based on observations of transverse sections of corn stalk tissues, Ithaca, N. Y., 1958.

Inbred	Stalk diam. in mm.	% rind in stalk	No. bundles per sq. mm. rind	No. bundles per sq. mm. pith.
Oh26	17.0	22.6	6.1	1.4
Oh43	20.0	16.1	3.5	0.8
C103	18.8	20.7	4.2	0.9
Oh7	22.8	24.1	2.9	0.7
38-11	22.0	18.7	4.1	0.7
L317	19.1	17.7	4.1	0.9
A401	15.1	19.5	7.5	1.5
Oh51A	19.4	20.8	5.3	0.9
Os420	18.8	20.8	4.9	1.1
Pa54	17.0	23.3	5.7	1.2

Ontario, Canada (C. G. Mortimore, N. J. Whitney)

Seed of 6 inbreds was supplied and the Harrow entries were added at planting. One half of the plants were inoculated artificially, the other 1/2 were observed until October 24 for breakage under natural conditions. All inbreds of the two planting dates were found very susceptible when tested by artificial inoculation with a Canadian isolate of G. zeae. However, under natural conditions there was a great difference in stalk breakage. Oh26, L317, 38-11, and Oh07 were resistant, and Oh51A and

Os420 were susceptible. Of the Harrow entries, CH9 and B14 were resistant; CH157 and M13 susceptible. Severe rotting of the internodes of all inbreds when artificially inoculated confirmed previous observations by these workers that resistance to stalk breakage does not reside in the stalks, but in the roots of corn plants grown at Harrow. Table 4 is a summary of the data obtained at Harrow.

Table 4. Summary of infection data on artificially-inoculated and naturally infected corn inbreds, Harrow, Ont., Can., 1958.

Inbred	Halfsilk		% disease (art.)		% stalk rot (nat.)	
	1st pl.	2nd pl.	1st pl.	2nd pl.	1st pl.	2nd. pl.
Oh07	8-15	8-29	100	95	0	0
38-11	8-17	9- 1	100	100	3.1	0
L317	8-20	9- 2	100	100	5.6	3.3
Oh26	8- 5	8-16	100	100	0	26.7
Oh51A	8- 4	8-15	92	100	72.2	63.3
Os420	8- 7	8-17	100	100	100	80.6
B14	8-11	8-27	98	100	0	0
CH9	7-30	8-15	83	95	26.7	5.7
CH157	7-30	8-11	95	100	100	60
M13	7-28	8- 9	100	92	91.3	100

Pennsylvania (C. C. Wernham and G. W. Gorsline)

Six inbreds were planted at University Park. One half were inoculated artificially, the other 1/2 left uninoculated for observation. The natural infection of stalks at the ground level (crown rot) was noted, two strains of the *Gibberella* fungus were compared for pathogenicity, and different methods of measuring artificial rot in the inoculated internodes were compared.

Crown rot incidence was less than 10% in Oh51A and Os420, and completely lacking in Oh26, L317, and 38-11. The order of infection of the six inbred lines from most resistant to susceptible was 38-11, Oh51A, L317, Oh26, Os420, and Oh07. There was a range of stalk rot reactions within inbreds but any one inbred could be reselected to improve its stalk rot performance

The data on *G. zeae* strain behavior indicated that differences in pathogenicity do occur, and that resistant inbred lines should be used to distinguish those differences. Correlations between methods of measuring stalk rot, e.g., visual classification, and actual measurements, were very high.

Plantings of the 10 inbreds were made at Centre Hall and Hershey; no data were taken.

West Virginia (M. W. Johnson)

Planting in West Virginia was delayed by a wet, cool spring and some of the inbreds of the second planting were still flowering at the time of first frost.

Maryland (R.G.Rothgeb)

Three plantings were made in June in Maryland. Very little stalk and root rot was found in observations made as late as November 11.

C. W. Boothroyd, Chairman
J. C. Anderson
C. C. Wernham

After the discussion of this topic the meeting adjourned to provide an opportunity for the standing committees to meet and develop plans and reports.

EVENING SESSION, MARCH 6

Following a dinner in the Terrace Room of the Henry Hudson Hotel, Chairman H. L. Everett called upon G. F. Sprague to give a general view of the Corn Conferences of the United States.

Dr. Sprague indicated that the present Corn Conferences could be considered as an indirect outgrowth of the earlier cooperation among maize genetic workers fostered by the late Prof. R. A. Emerson of Cornell University. However, the Purnell Corn Conference was the first formally organized conference. When funds for this Conference were discontinued an informal conference was continued through the efforts of the late Dr. F. D. Richey and the several State and Federal corn breeders. The Southern Corn Conference was established in 1939 and the Northeastern Corn Conference in 1945.

Each of the corn conferences has as one of its major objectives the unrestricted interchange of ideas and materials. This policy has undoubtedly been responsible for a significant portion of the progress that has been made.

It was pointed out that one of the topics receiving considerable attention at recent meetings of the North Central and Southern Conferences was the need for a greater emphasis on basic research. The present status

of the Hybrid Seed Corn Industry suggests that in many states there is little need for the past major emphasis on applied corn breeding.

Following this brief presentation there was a considerable discussion of the distinction between basic and applied research with respect to the various corn programs.

MORNING SESSION, MARCH 7

The meeting was called to order by Chairman Everett at 9:00 a.m. He asked Vice Chairman Johnson to take charge of the morning session. The session continued with a consideration of the various committee reports.

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 100 and 200 MATURITY

Twenty experimental hybrids with the best predicted double-cross performance were included in a uniform test in 1958 at six stations, including Maine, New York, Pennsylvania, Eastern States Farmers Exchange, Macdonald College, Quebec and Ottawa, Ontario. On the basis of the summarized test data (table 5), 10 hybrids have been selected for further testing in 1959 at the same six locations.

This Committee wishes to submit to the Conference, hybrid Maine 244 as a candidate for N.E. designation and if accepted suggest NE244 as a suitable designation. Data supporting this submission is presented in tables 6 and 7.

R. M. Bailey
R. I. Braun
F. Dimmock, Chairman

TABLE 5. (cont'd.)

Pedigree	Macdonald College, Que. Bus.P/A	% H ₂ O	Knoxville Penn. Bus.P/A	% H ₂ O	Ithaca N.Y. Bus.P/A	% H ₂ O	Monmouth Maine Bus.P/A	% H ₂ O*	Ottawa Ont. Bus.P/A	% H ₂ O	Average all locations Bus.P/A	% H ₂ O
30	85.6	41.5	78.0	25.6			57.3	65.3			85.6	41.5
04											78.0	25.6
250											57.3	
L.S.D. (5%)	6.1	1.7	7.0	2.3	N.S.		9.1		9.8			

Planted June 3 Planted May 16 Planted June 5 Planted May 20
Harvested Nov.5 Harvested Oct.31 Harvested Oct.10 Harvested Oct.8

e, % H₂O, not included in averages.

Table 6. Comparisons of candidates for N.E. designations in the Uniform 100-200 maturity series, 1958.

Location	Me244	Mel40	Warwick		Wis.		AES101		AES201	Mich.	NE210
	Bu H ₂ O	Bu H ₂ O	210	270	Bu H ₂ O	Bu H ₂ O	Bu H ₂ O	Bu H ₂ O	Bu H ₂ O	Bu H ₂ O	Bu H ₂ O
Ottawa	107-38	98-38	93-38	93-42	90-36	-----	-----	-----	-----	-----	-----
Quebec	105-42	94-41	87-46	92-47	79-41	94-44	-----	-----	-----	-----	-----
Monmouth, Me.	84-50	77-50	71-55	-----	-----	-----	57-65	-----	-----	-----	-----
Springfield, Mass.	82-23	65-25	73-27	-----	61-22	-----	-----	-----	-----	-----	-----
"	74-24	66-25	-----	-----	56-24	64-25	-----	-----	-----	86-28	-----
Knoxville, Pa.	77-22	78-22	71-27	-----	-----	-----	-----	-----	-----	-----	-----

Stalk Strength

At Ottawa - (broken) less than Mel40, Warwick 210, Wis. 270, same as AES101.
 Quebec - (broken) less than Mel40, Wis. 270, Warwick 210, same as AES101.
 Springfield - (erect) better than Warwick 210, AES201, AES101, Mich. 160, Wis. 240, Mel40, less than NE210.
 Knoxville, Pa. - (Strong stalks) better than Mel40, Minn. 804, Warwick 210, less than Wis.255.

Table 7. Summary of comparative performance of Me244 (A96 x MSL341 x WD x SD105) corn hybrid.

Year & Place	Me244		Wis240		Me140		Wis270		Mich250		NE210		201E x Me13 x	
	Bu/A	H ₂ O	Bu/A	H ₂ O	Bu/A	H ₂ O	Bu/A	H ₂ O	Bu/A	H ₂ O	Bu/A	H ₂ O	SD105	x Col31
1951													Bu/A	H ₂ O
Monmouth	77	45	88	42	113	40								
Fryeburg	71	45	72	42										
1953														
Monmouth	81	42	80	41	86	41								
Fryeburg	74	38	84	38	83	36								
1954														
Monmouth	58	50	56	50	63	48	56	54						
Fryeburg	73	44	63	43	75	42	75	49						
Corinna	43	56	42	53	50	50	46	59						
1955														
Monmouth	91	40	88	42	94	41	92	43	95	44				
Fryeburg	68	32	62	34	71	30	75	35	64	35				
Weeks Mills	93	37	92	38	101	36	99	40	105	39				
1956														
Monmouth	52	56			59	49	50	61						
Weeks Mills	63	53			74	49	52	63						
S. China	38	62			46	55								
Walpole, N.H.	76	24	70	27	87	25	75	24						
Bradford, Vt.	57	41	42	45	68	33	64	49						
1957														
Monmouth	101	40			98	39			94	47	84	45	95	40
Fryeburg	118	40			107	38			113	44	97	44	115	38
Hinkley	74	43			66	42			49	48	46	47	66	40
Quebec, Can.	110	37	105	37										
1958														
Monmouth	85	49			73	48							90	48
Fryeburg	82	38			69	37							75	35
Mon.-NECIC	84	50			77	50			57	65				
Av.dev. from Me244			-2.1	+0.1	+3.6	-2.6	+1.0	+4.4	-7.3	+5.7	-22.0	+4.3	-3.8	-1.8
No. comparisons			13		20		10		7		3			5

There followed a considerable discussion on maturity ratings and it was MOVED by G. W. Gorsline and seconded by H. L. Everett "That the committee for the 100-200 maturity series be empowered to set new maturity standards."

Motion passed

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 300 and 500 MATURITY

Plans were developed for the production of two sets of top-cross seed in 1959 for 1960 testing. The tester parents to be used and the lines nominated are indicated below. Provision was made for additional nominations in either group prior to planting time.

NE420 (tester)	M4 (tester)
NY D62	Pa 32
NY D4	A509
NY M2	W153R
NY KR2	W182D
NY D410	W37A
NY 65	C153
A206	NYCD 220
Pal09	NY 821 C16
RL68	NYD16
	NY 709-2
	NY 697-1
	NY 703-1

G. W. Gorsline (Acting Chairman)

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 600 and 700 MATURITY

A series of 14 double crosses were compared at two or more locations in 1958. Three additional double crosses were included in the New York tests. The data for this maturity series are presented in table 8.

H. L. Everett
H. T. Stinson
D. L. Matthews, Chairman

Table 8. Performance of double crosses of the uniform 700 maturity group in 1958.

Pedigree*	NECC Code Number	Ave. All Locations		Eastern States Farmers' Exch. Georgetown, Delaware					N.Y.AES Cayuga Co. N.Y.				
		%		Height (Inches)		Pl. Ear		DSG	%		%		
		Bu/A		H2O		Brk.			Bu/A				
		Up		H2O		Up			H2O				
Ind. 608	55739	108	32.3	106	20.8	6	40	76	34	49.5	62.8	26.2	
(AxTr-1)(Wf9xHy2)	55763	103	31.6	106	18.2	5	48	73	38	46.2	62.6	26.1	
(A-26xTr-1)(Wf9xHy2)	55767	67	40.4	86	20.6	41	9	73	35	48.0	60.3	28.1	
(TrPa.54)(Wf9xHy2)	55768	80	40.9	105	19.8	15	30	76	37	53.9	62.0	27.5	
(Tr-1xPa.54)(Wf9xHy2)	55769	102	30.8	104	20.1	15	34	74	34	55.2	57.4	30.7	
(Tr-2xPa.54)(Wf9xHy2)	55772	80	37.9	102	19.7	27	23	73	34	57.3	56.1	31.3	
(Wf9xCI42A)(Tr-1xPa.54)	55776	92	31.4	99	19.0	4	55	75	40	49.5	59.3	30.7	
Other related hybrids													
(A-26xTr-1)(Pa.83xCI42A)				95	20.6	26	29	78	38				
(Tr-1xPa.54)(Pa.83xCI42A)				106	18.3	14	37	76	36				
(Wf9xCI42A)(AxTr-1)				101	19.7	7	52	76	39				
(Wf9xCI42A)(A-26xTr-1)	109	24.7		106	18.0	8	41	76	39				
(Wf9xCI42A)(TrxPa.54)				105	20.8	6	50	78	44				
Ohio W64	107	25.3		97	19.5	24	12	75	33				
Pa. 602A	109	23.8		100	17.4	17	27	71	30				
Ohio K62										64.1	51.1	36.1	
Mich. 430										61.5	52.3	35.3	
(Oh51AxB8)(Pa.54xOh5)										69.1	50.5	39.1	
LSD .05													
NS													
2.6													
Planted 5/13													
Harvested 10/8													
Randomized Block													
Planted 5/28													
Harvested 10/30													
Balanced Lattice													

Tr-1 and Tr-2 = (TrxC103)Tr9)S5
A-26 = "green A" selection by C. C. Wernham; believed to be closely related to M14.

Table 8. (cont'd.)

Eastern States Farmers' Exchange																						
Pedigree*	NECC Code Number	Average Pennsylvania				Nescopeck, Pennsylvania				Renfrew, Pennsylvania				Shelocta, Pennsylvania				Feeding Hills, Mass.				
		%		Bu/A	H2O	%		Bu/A	H2O	Up	%		Bu/A	H2O	Up	%		Bu/A	H2O	Up	Pl.	Ear
		Bu/A	H2O			Bu/A	H2O				Bu/A	H2O				Bu/A	H2O					
Ind. 608	55739	137	27.0	132	28.2	58	130	26.8	44	148	26.1	45	80	29.0	10	88	46					
(AxTr-1)(Wf9 x Hy2)	55763	132	27.3	133	27.6	71	128	27.8	45	134	26.5	65	70	27.1	13	88	47					
(A-26xTr-1)(Wf9xHy2)	55767																					
(Tr x Pa.54)(Wf9 x Hy2)	55768	126	27.2	127	27.6	62	114	27.4	47	137	26.5	48	76	26.1	10	85	34					
(Tr-1 x Pa.54)(Wf9xHy2)	66769																					
(Tr-2 x Pa.54)(Wf9xHy2)	55772	112	28.0	112	28.6	34	104	28.0	33	120	27.3	54	68	26.4	10	86	46					
(Wf9xCl.42A)(Tr-1xPa.54)	55776																					
Other related hybrids																						
(A-26xTr-1)(Pa.83xCl.42A)		126	26.9	126	27.6	48	125	27.8	55	127	25.2	34	60	25.1	10	87	45					
(Tr-1xPa.54)(Pa.83xCl.42A)																						
(Wf9xCl.42A)(A x Tr-1)																						
(Wf9xCl.42A)(A-26 x Tr-1)																						
(Wf9xCl.42A)(Tr x Pa.54)																						
Ohio W64		121	26.7	129	27.6	61	112	25.8	26	120	26.8	40	76	26.8	8	89	45					
Pa.602A		121	25.2	114	27.4	69	122	28.4	34	127	23.8	33	82	25.8	4	90	42					

LSD .05

9.0

10.0

* Tr-1 and Tr-2 = (TrxCl03)Tr-3)S₅

A-26 = "green A" selection by C. C. Wernham; believed to be closely related to M14.

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 800 and 900 MATURITY

The committee for the 800-900 maturity group conducted tests of 23 three-way crosses in 1958. Seed of this material was produced by the Pennsylvania Station. Pennsylvania, New Jersey and Maryland participated in the tests. The data from the Maryland test has been excluded from the summary because of wet spots in the test area.

Pennsylvania will make predictions from the summarized results. The best of the inbred lines from this group plus additional inbreds will be used to prepare an all combination series for testing in 1960.

In 1959, Pennsylvania, New Jersey, Maryland and the Pennsylvania Farm Bureau will test a group of approximately 20 three-way crosses produced by the Pennsylvania Station. This group consists of variants and derivatives of 38-11, Hy and L317 crossed to WF9 x Oh07 as a common tester.

R. G. Rothgeb
J. C. Anderson, Chairman

REPORT OF THE COMMITTEE ON POLLINATING SUPPLIES-1958

Orders for two years' supply of silk bags of the following specifications: 40# Ripco Aqua Wrap bags sealed with water-proof adhesive throughout were coordinated for Conference members in two sizes in 1958 as follows:

	Thousand Bags <u>3" x 8"</u>		Thousand Bags <u>2$\frac{1}{2}$" x 6$\frac{1}{2}$"</u>
Maryland	10M	Maine	10M
Massachusetts	4	Pennsylvania	25
New Jersey	65	Eastern States	10
West Virginia	10		
Eastern States	<u>231</u>		
	320M		45M

Total 365M

The low bid was \$3.18/M by The Carter Paper Company, Springfield, Mass.

A survey of interest and need indicates that seven Conference members will cooperatively purchase 225,000 tassel bags in two sizes in 1959. Ten members expressed no interest.

H. L. Everett
Robert Snell
D. L. Matthews, Chairman

REPORT OF THE COMMITTEE ON NOMENCLATURE OF CYTOPLASMIC STERILITY

This committee made no formal report but reviewed the recommendations of the Southern and North Central regions, and suggested that a further study be made. As long as only one type of cytoplasm is being used perhaps a simpler terminology will be adequate and less confusing than the terminology already proposed.

R. S. Snell
H. L. Everett
G. H. Stringfield
D. F. Jones, Chairman

REPORT OF THE COMMITTEE ON REGISTRATION OF NE HYBRIDS

The Maine Experiment Station submitted Maine 244, (A96 x MS1341)(SD105 x WD), for consideration for registration as a NE hybrid. The committee reviewed the evidence submitted and recommended it be accepted. It was finally adopted as NE 144 since the evidence indicated it was in an earlier maturity group than the 200 series.

This hybrid has been tested from 1951 to 1958 in Maine at several different locations. In 1956 additional tests were carried out in New Hampshire and Vermont; in 1957 in Quebec, Canada, and in 1958 at Ottawa and Quebec, Canada, 2 tests in Massachusetts and one in Pennsylvania. In comparison with other hybrids of the same maturity this hybrid has shown superior yielding ability in many trials and equal or better stalk quality.

Eastern States Farmers' Exchange has submitted Experimental Hybrid 600, (Oh26A x Oh51A)(Minn.A206 x Pal09F), for further testing for consideration as a NE hybrid. Seed is available and all those interested in hybrids of this maturity are urged to include this in their trials.

C. R. Funk
R. G. Rothgeb
D. F. Jones, Chairman

REPORT OF THE COMMITTEE ON DISEASE AND INSECT PESTS OF CORN

No formal report was presented. There was a discussion of the various problems of importance and it was proposed that available information be summarized and presented at the Conference in 1960. It was pointed out that the cooperative stalk rot project was to be continued in 1959 following somewhat the same general procedures as in 1958. The details of the individual studies are to be worked out by the cooperating stations.

J. C. Anderson
C. W. Bothroyd
C. C. Wernham, Chairman

REPORT OF THE COMMITTEE ON THE PRESERVATION OF
OPEN-POLLINATED VARIETIES

No formal report was presented but Dr. Bailey reported that the Plant Introduction Station at Geneva, N. Y., had received seed of approximately 12 open-pollinated varieties.

REPORT OF THE NOMINATING COMMITTEE

Dr. Rothgeb reported the nomination of Dr. Dimmock for Vice-Chairman of the 1959 Conference. The nomination was seconded by Dr. Jones who then moved that the secretary be instructed to cast a unanimous ballot for Dr. Dimmock. This motion was seconded and passed.

Following these committee reports the Conference returned to a consideration of the discussion topics which had not been completed at the Friday afternoon session.

Preliminary report of dwarf vs. normal hybrids at several populations
1958

This experiment was conducted on the farm of Cliff Snyder, Pittstown, N. J.

The normal hybrids used were ones currently or about to be recommended, hence well adapted. These hybrids are the ones the dwarf type will have to displace if they are to find a place in New Jersey agriculture.

The dwarf hybrids included were those available from the several sources willing to have them tested. The sources of all hybrids were:

N. J. Crop Improvement Association, Allentown, N. J.

N. J. 9
N. J. 5412
N. J. 5311
Conn. 554

Grange League Federation, Ithaca, N. Y.
Ohio W64

Eastern States Farmers' Exchange, West Springfield, Mass.
Pa. 602 normal
Pa. 602 dwarf

Pfister Associated Growers, Aurora, Ill.

12003

12017

12026

Northrup-King, Minneapolis, Minn.

Dwarf #2

Illinois Seed Producers Assoc., Urbana, Ill.

Ill. #1

Ill. #8

Ill. #56

North Carolina Agr. Expt. Sta., Raleigh, N. C.

N. C. 8001

The experimental design was factorial with 3 replications.

The plots were 4 rows wide by $17\frac{1}{2}$ feet long. The center 2 rows were harvested for yield and used for all other data collected.

The fertility was maintained at a high level and moisture was ample all during the growing season.

The test area was free of weeds when layed by.

Table 9. Comparisons of Normal and Dwarf Hybrids Grown in New Jersey in 1958.

Normal Hybrids	Yield of Grain Thousands of plants/acre					Moisture in Grain at Harvest Thousands of plants/acre				
	10.5	15.7	20.9	26.2	Mean	10.5	15.7	20.9	26.2	Mean
N. J. 9	132.5	137.2	149.8	140.3	139.9	29.6	28.8	28.6	28.6	28.9
N. J. 5412	107.0	118.6	149.6	137.6	128.2	25.6	25.5	27.3	25.4	25.9
5311	93.6	112.0	130.3	122.2	114.5	23.6	24.9	24.2	23.1	24.0
Ohio W64	89.8	126.3	130.7	135.9	120.6	24.7	24.7	25.4	23.8	24.6
Conn. 554	96.1	109.9	129.4	123.5	114.7	21.8	22.1	21.7	22.8	22.1
Pa. 602	103.0	109.8	120.7	122.5	114.0	22.4	23.3	23.9	22.2	23.0
Mean	103.6	118.9	135.0	130.3	121.9	24.6	24.9	25.2	24.3	24.7
<u>Dwarf Hybrids</u>										
Pa. 602	96.2	108.8	126.2	126.1	114.1	27.8	26.1	26.4	26.6	26.7
N.K. #2	80.3	87.3	103.3	91.8	90.7	28.9	23.1	23.9	23.9	24.9
PAG 12003	96.3	105.4	115.4	110.6	107.0	28.4	29.8	29.4	29.0	29.1
12017	93.4	86.9	98.2	95.9	93.6	26.2	26.8	26.5	25.1	26.1
12026	75.5	92.2	90.4	98.2	89.1	27.1	24.4	25.2	25.4	25.5
Ill.* #8	89.1	96.8	102.0	108.9	100.4	29.9	29.6	30.0	28.2	29.4
#56	85.4	110.3	113.7	97.6	101.7	28.7	28.6	29.2	29.4	29.0
#1	103.7	102.3	115.7	122.7	111.1	28.8	28.0	28.8	29.0	28.6
N.C. 8001	88.7	118.7	110.2	96.2	103.4	31.0	32.4	32.2	32.4	32.4
Mean	89.8	100.9	108.3	105.3	101.2	28.5	27.6	28.0	27.7	28.0

Treatment L.S.D. @ 5% =	19.2 bu.	2.0%
1% =	25.5	2.7
Plant pop. L.S.D. @ 5% =	5.0	N.S.
1% =	6.6	
Hybrid L.S.D. @ 5% =	10.0	1.4
1% =	13.0	1.9

- Observations:
1. Dwarf hybrids yielded somewhat less grain than the normal at all population levels.
 2. Dwarf hybrids, in both yield and maturity, responded to plant population changes to about same degree as normal.
 3. The only direct comparison, that of Pa. 602, showed similar yields but delayed maturity for the dwarf version.

*Illinois No. 8 (2x678)x(9x38)
 No. 56 (38x6)x(9x2)
 No. 1 (17xSw)x(9x2)

N.C. 8001 (9N6xVD) (95BYx16HB10)

Table 9. (cont'd.)

Normal Hybrids	Lodging Thousands of plants/acre					Plants Broken Below Ear Thousands of plants/acre				
	10.5 %	15.7 %	20.9 %	26.2 %	Mean	10.5 %	15.7 %	20.9 %	26.2 %	Mean
N. J. 9	3	8	14	18	11	0	7	19	23	12
N. J. 5412	3	4	12	3	5	3	12	11	26	13
5311	1	7	17	9	8	0	6	17	15	9
Ohio W64	0	2	2	3	2	0	2	4	6	3
Conn. 554	1	1	6	4	3	3	5	5	9	5
Pa. 602	4	6	7	11	7	5	13	22	29	17
Mean	2	5	10	8	6	2	7	13	18	10
<u>Dwarf Hybrids</u>										
Pa. 602	0	1	0	2	0.7	1	3	0	1	1.0
N.K. #2	0	0	1	0	0.2	8	6	2	2	4.5
PAG 12003	0	0	0	0	0	0	0	0	0	0
12017	0	0	0	0	0	0	2	0	2	1.0
12026	1	3	0	0	1.0	0	0	2	4	1.5
Ill. #8	0	0	0	0	0	2	1	0	1	1.0
#56	0	0	0	0	0	0	0	1	1	0.5
#1	0	0	0	0	0	0	9	1	8	4.5
N. C. 8001	0	0	0	0	0	0	0	1	0	0.2
Mean	0.1	0.4	0.1	0.2	0.2	1.2	2.3	0.8	2.1	1.6

- Observations:
1. Root lodging was no problem among dwarf hybrids.
 2. Breaking of plants below the ear was no problem among dwarf hybrids.
 3. Both root lodging and broken plants were hazards among normal hybrids each tending to increase with population.
 4. If these tendencies persist year after year dwarf corn could be left longer in the field to reduce moisture and cut possible crib spoilage.

Table 9. (cont'd.)

Normal Hybrids	% Stalk Rot					Weeds in Plot				
	Thousands of plants/acre					1 - clean	10 - weedy			
	10.5	15.7	20.9	26.2	Mean	Thousands of	plants/acre	Thousands of	plants/acre	Mean
	%	%	%	%						
N. J. 9	0	7	10	19	9	2	1	1	1	1.2
N. J. 5412	1	9	8	25	11	2	1	1	1	1.2
5311	0	4	16	15	9	2	1	1	1	1.2
Ohio W64	0	1	4	6	3	3	1	1	1	1.5
Conn. 554	3	5	5	7	5	2	2	1	1	1.5
Pa. 602	5	13	20	26	16	2	1	1	1	1.2
Mean	1.3	6.8	10.5	16.0	9	2	1	1	1	1.3
Dwarf Hybrids										
Pa. 602	1	3	0	1	1	2	1	1	1	1.2
N. K. #2	8	6	2	2	4	4	1	2	1	2.0
PAG 12003	0	0	0	0	0	2	2	1	1	1.0
12017	0	2	0	2	1	2	2	1	1	1.5
12026	0	0	8	4	3	3	2	3	1	2.2
Ill. #8	2	1	0	1	1	3	1	1	1	1.5
#56	0	0	1	0	0.2	2	1	1	1	1.2
#1	0	9	1	8	4	1	1	1	1	1.0
N.C. 8001	0	0	1	0	0.2	1	1	1	1	1.0
Mean	1.2	2.3	1.4	2.0	1.7	2.2	1.3	1.3	1.0	1.5

- Observations:
1. Weed control was noticeably better in the normal corn except at 10,000 plants per acre.
 2. The earlier maturing hybrids of each type permitted more weed growth than the later ones.
 3. The higher corn populations gave good weed control in both kinds of corn.
 4. Stalk rot averaged 4-fold more in the normal than in the dwarf corn.
 5. Stalk rot increased with plant population for normal plants but was independent of it in the dwarfs.
 6. The various hybrids differed greatly in resistance to stalk rot. The best normal hybrid was about the same as the worst of the dwarfs in this characteristic.
 7. A significant interaction exists between hybrids and plant population with respect to stalk rot resistance among the normal hybrids.

Table 9. (cont'd.)

Normal Hybrids	Damaged Ears*					Ears Well Filled				
	Thousands of plants/acre					Thousands of plants/acre				
	10.5	15.7	20.9	26.2	Mean	10.5	15.7	20.9	26.2	Mean
	%	%	%	%	%	%	%	%	%	%
N. J. 9	1	0	0	3	1.0	97	97	93	90	94
N. J. 5412	2	0	1	2	1.2	92	98	95	87	93
5311	0	3	0	0	0.7	96	95	92	95	94
Ohio W64	0	0	2	0	0.5	96	96	93	93	94
Conn. 554	0	0	1	0	0.2	97	99	93	87	94
Pa. 602	2	0	0	0	0.5	99	98	92	92	95
Mean	1.2	0.7	1.0	1.2	0.5	96	97	93	91	94
Dwarf Hybrids										
Pa. 602	0	0	2	2	1.0	90	93	85	85	88
N. K. #2	5	2	0	3	2.5	97	92	80	87	86
PAG 12003	0	1	2	3	1.5	90	93	85	83	88
12017	0	2	0	2	1.0	93	83	88	82	86
12026	0	0	0	8	2.0	93	95	87	70	86
Ill. #8	3	2	9	3	4.2	90	96	87	94	92
#56	5	2	3	2	3.0	99	90	83	80	88
#1	0	2	2	5	2.2	95	92	88	80	89
N.C. 8001	2	0	1	1	1.0	91	93	90	95	92
Mean	1.7	1.2	2.1	3.2	2.1	93	92	86	84	89

- Observations:
1. Percent of damaged ears 4 times as great on dwarf as on normal corn.
 2. Percent of damage ears increased with increase in plant population on dwarf corn; no differences in normal corn.
 3. The percent of fully pollinated ears decreased with increased populations on both corn types but dwarf was more severely affected.
 4. Dwarf corn averaged from 3-7 percent less well filled ears at populations from 10 thousand to 26 thousand plants per acre.
 5. Estimated loss due to damaged ears was about $1\frac{1}{2}$ bushel for normal corn to $3\frac{1}{2}$ bushel for the dwarf type.

*Ears damaged by rodents, pheasants, birds or from drooping to touch soil.

Table 9. (cont'd.)

Normal Hybrids	Height of Plants Thousands of plants/acre					Height of Ears Thousands of plants/acre				
	10.5	15.7	20.9	26.2	Mean	10.5	15.7	20.9	26.2	Mean
N. J. 9	93	98	101	104	99	43	44	48	45	45
N. J. 5412	83	95	88	95	90	35	39	37	38	37
5311	87	88	88	92	89	37	33	35	37	35
Ohio W64	82	85	87	88	85	27	35	33	31	32
Conn. 554	82	85	83	78	82	30	34	32	30	32
Pa. 602	88	90	85	94	89	36	35	37	36	36
Mean	86	90	89	92	89	35	37	37	36	36
<u>Dwarf Hybrids</u>										
Pa. 602	52	54	60	60	56	16	19	22	22	18
N. K. #2	51	50	53	51	51	19	16	16	17	17
PAG 12003	45	50	52	51	49	15	18	19	18	17
12017	59	56	59	57	58	18	17	17	20	18
12026	49	48	56	56	53	13	16	18	17	16
Ill. #8	55	53	51	59	54	16	18	19	20	18
#56	50	54	51	57	53	16	19	16	21	18
#1	60	51	55	58	56	19	19	19	20	19
N. C. 8001	58	66	64	70	64	22	21	27	29	25
Mean	53	54	56	58	55	17	18	19	20	18

- Observations:
1. The only direct comparison of dwarf vs. normal was in Pa. 602, and showed a mean reduction in plant height of 34 inches and in ear height of 18 inches.
 2. The lower center of gravity was reflected in less root lodging and less stalk breakage.
 3. Increased height of plant and ear tended to result from higher plant populations.

J. C. Anderson

Present Status of Recurrent Selection in Corn Breeding

Recurrent selection as method of corn breeding may be considered under four somewhat arbitrary sub-divisions. These are recurrent selection on the basis of phenotype, recurrent selection for general combining ability, recurrent selection for specific combining ability and reciprocal recurrent selection. The last three involve the use of a tester parent and their relative efficiency would be expected to vary depending upon the relative importance of different types of gene action in heterosis.

Studies reported from the Iowa program indicate that recurrent selection on the basis of phenotype was more effective than conventional inbreeding in modifying oil percentage of the corn grain. The results obtained suggest an increase in efficiency of approximately 300-500 percent. Using a somewhat different experimental approach Dr. Jenkins and his collaborators at Beltsville have shown that this method has proven effective in concentrating genes for resistance to leaf blight, Helminthosporium turcicum. Unpublished results from several Stations indicate that the method may be useful in changing gene frequency for a wide variety of attributes including resistance to stalk rot.

Recurrent selection for general combining ability and for specific combining ability would be expected to vary in efficiency depending upon the relative importance of additive and dominance effects. The latter method may also be used to obtain a measure of the relative importance of these two types of gene action. Studies conducted in the Iowa program indicate that additive effects may be of major importance.

Studies under way at the North Carolina and Iowa Stations indicate that recurrent selection for specific combining ability may be an effective breeding procedure.

This may be illustrated by unpublished data from the Iowa Station. Two synthetics, Stiff Stalk and Corn Borer No. 1, were used as parental material. The results covering two cycles of reciprocal recurrent selection are as follows:

Parentage	Yield	Stalk Lodging %
Co x Co	76.3	23.3
C1 x C1	81.1	26.6
C2 x C2	89.6	25.7
Double cross standards	84.9	27.0

Since the double cross standards represent the best material available after 35 years of utilization of inbreeding and hybridization techniques the results from recurrent selection, based on approximately 10 years of effort, appear promising.

NEW BUSINESS

It was MOVED by D. L. Matthews that the work conference request the Chairman set up a five man committee to study the question of open-pedigree hybrids, inbred release and inbred sharing.

Seconded by G. W. Gorsline and passed.

Upon further discussion it was recommended that representation on such a committee might well include Eastern States, Pennsylvania Farm Bureau and the New York, New Jersey and Pennsylvania Experiment Stations.

It was MOVED by D. F. Jones that at subsequent meetings of the Northeastern Corn Improvement Conference the Program Chairman serve for the entire meeting.

The motion was seconded by H. L. Everett and passed.

Meeting adjourned at 12⁰⁰ noon.

ROSTER OF ATTENDANCE

Canada

Brawn, Robert I.	Macdonald College	Montreal
Dimmock, Fred	Dept. of Agriculture	Ottawa

Connecticut

Buchert, J. G.	Agric. Expt. Sta.	New Haven
Jones, D. F.	" " "	"
Stinson, H. T.	" " "	"

Maine

Bailey, R. M.	University of Maine	Orono
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Maryland

Rothgeb, R. G.	University of Maryland	College Park
Sprague, G. F.	Crops Research Div.,ARS	Beltsville

Massachusetts

Matheson, J. A.	Eastern States Far. Exchg.	W.Springfield
Mathews, D. W.	" " " "	"
Pearson, O. H.	" " " "	"
Yegian, H. M.	Univ. of Massachusetts	Amherst

New Jersey

Anderson, John C.	Rutgers University	New Brunswick
Funk, C. R.	" "	"
Gerwig, John	" "	"
Mayis, M.	" "	"
Cranstown, W. M.	Department of Agriculture	Trenton

New York

Barnes, J. M.	Cornell University	Ithaca
Boothroyd, C. W.	" "	"
Everett, H. L.	" "	"
Haws, C. L.	" "	"
Miller, R. E.	" "	"
Walden, D. B.	" "	"
Wheeler, D.A.	" "	"

Pennsylvania

Butler, Dan.	Penna. Farm Bureau	Harrisburg
Gorsline, G. W.	Penna. State Univ.	Univ. Park
Wernham, C. C.	Penna. State Univ.	" "

Washington, D. C.

Heerman, R. M.	SESD, U.S.D.A.	D. C.
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West Virginia

Crum, C. W.	Univ. of W. Virginia	Morgantown
Johnson, M. W.	" " "	"

OFFICERS AND COMMITTEE MEMBERSHIP, 1959

Administrative Advisor

G. Fred Somers

Executive Committee

M. W. Johnson, Chairman
F. Dimmock, Vice-Chairman
H. L. Everett

Committee on Registration of NE Hybrids

D. F. Jones, Chairman
R. Funk
R. G. Rothgeb

Committee on Uniform Tests of 100-200 Maturity

F. Dimmock, Chairman
R. M. Bailey
R. I. Brawn

Committee on Uniform Tests of 300-500 Maturity

G. Gorsline, Chairman
H. L. Everett
H. M. Yegian

Committee on Uniform Tests of 600-700 Maturity

D. L. Matthews, Chairman
H. T. Stinson
D. Butler
R. Funk

Committee on Uniform Tests of 800-900 Maturity

J. C. Anderson, Chairman
R. G. Rothgeb
M. W. Johnson

Committee on Pollinating Supplies

D. L. Matthews, Chairman
R. S. Snell
M. W. Johnson

Committee on Nomenclature of Cytoplasmic Sterility

D. F. Jones, Chairman
R. S. Snell
H. L. Everett

Committee on Stalk Rot Disease

C. W. Boothroyd, Chairman
J. C. Anderson
C. C. Wernham
R. Cappellini
N. J. Whitney

Committee on the Preservation of Open-Pollinated Varieties

R. M. Bailey, Chairman

Committee on Inbred Release Policy

J. C. Anderson, Chairman
D. Butler
H. L. Everett
D. L. Matthews
G. Gorsline
W. I. Thomas

